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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/601,021	06/19/2003	Douglas Werner	HIT1P020A/SJO9-2001-0068U	7090
28875	7590	08/26/2004	EXAMINER	
Zilka-Kotab, PC P.O. BOX 721120 SAN JOSE, CA 95172-1120			KIM, PAUL D	
			ART UNIT	PAPER NUMBER
			3729	
DATE MAILED: 08/26/2004				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/601,021	WERNER, DOUGLAS	
	Examiner	Art Unit	
	Paul D Kim	3729	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-15 and 20-38 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 9-15 and 20-38 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of;
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this

Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 9-13, 20-22, 24, 27, 30, 31, 33 and 36 are rejected under 35 U.S.C. 102(e) as being anticipated by Sato (US PAT. 6,563,678).

Sato teaches a process of forming a thin film magnetic head comprising steps of: depositing a shield layer (20) as shown in Fig. 14; etching a recessed portion (20a) in an upper surface of the shield layer, the recessed portion of the shield layer defining a protruding portion of the shield layer as shown in Fig. 15; depositing a first gap layer (38) on top of the recessed portion of the shield layer as shown in Fig. 16; depositing a second gap layer (21) on top of the first gap layer and the protruding portion of the shield layer; positioning an MR sensor (23) on top of the second gap layer in vertical alignment with the protruding portion of the shield layer; positioning first and second lead layers (25) on top of the second gap layer, the first and second lead layers being connected to the MR sensor as shown in Fig. 17; and depositing a third gap layer (26) on top of the second gap

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layer, the MR sensor, and the first and second lead layers as shown in Fig. 5 (see also col. 13, line 21 to col. 16).

As per claim 10 the first gap layer includes an upper surface substantially level with an upper surface of the protruding portion of the shield layer as shown in Figs. 16 and 17.

As per claim 11 an upper surface of the second gap layer is planar as shown in Fig. 17.

As per claims 12, 27 and 36 a combined thickness of the first gap layer, second gap layer, and third gap layer is thinner adjacent to the MR sensor and the protruding portion of the shield layer than the recessed portion of the shield layer as shown in Fig. 5. Also, as per claims 27 and 36, the second gap layer is provided for insulating between the lead layer and the shield layer (see also col. 14, line 62 to col. 15, line 4).

As per claim 13 the recessed portion of the shield layer is etched utilizing ion milling (see col. 13, line 24).

As per claims 21, 22, 30 and 31 the first, second and third gap layers are formed of alumina or aluminum oxide (see col. 11, lines 29-32).

As per claims 24 and 33 a size of the protruding portion of the shield layer is larger than a size of MR sensor as shown in Fig. 5.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sato in view of Sasaki (US PAT. 6,729,012).

Sato teaches all of the limitations as set forth above including ion milling process for etching the shield layer. However, Sato does not teach RIE process for etching the shield layer. Sasaki teaches a process of forming a thin film magnetic head including a process of etching the shield layer (3) with RIE in order to remove effectively a selective portion of the shield layer (see also col. 16, lines 31-35). Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify a process for etching the shield layer of Sato by RIE as taught by Sasaki in order to remove effectively a selective portion of the shield layer.

5. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sato in view of Yazawa et al. (US PAT. 6,751,071).

Sato teaches all of the limitations as set forth above including ion milling process for etching the shield layer. However, Sato does not teach wet etching process for etching the shield layer. Yazawa et al. teaches a process of forming a thin film magnetic head including a process of etching the shield layer (7b) with wet etching in order to improve etching controllability (see also col. 12, lines 45-58). Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify a process for etching the shield

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layer of Sato by wet etching as taught by Yazawa et al. in order to improve etching controllability.

6. Claims 23 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato in view of Sasaki (US PAT. 6,598,289).

Sato teaches all of the limitations as set forth above. However, Sato does not teach CMP process for flattening an upper surface of the first gap layer.

Sasaki teaches a process of forming a thin film magnetic head including a process of polishing an upper surface of the gap layer with CMP process for the purpose of flattening the upper surface of the gap layer effectively (see also col. 5, lines 32-37). Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify a process for forming substantially level for the upper surface of the first gap layer of Sato by CMP process as taught by Sasaki for the purpose of flattening the upper surface of the gap layer effectively.

7. Claims 25, 26, 28, 29, 34, 35, 37 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sato.

Sato teaches all of the limitations as set forth above including the MR sensor formed of multilayer including ferromagnetic material. One of ordinary skill in the art would have expected Applicant's invention to perform equally well with the ferromagnetic material of Sato because the Ni-Fe as recited in the claimed invention would perform equally well with the ferromagnetic material in Sato. Therefore, it would have been an obvious matter of design choice to modify the

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ferromagnetic material of Sato to obtain the invention as specified in claims 25 and 34.

Also, Sato does not teach the electrode layer made of copper. Even though the electrode layer of Sato is not specified, one of ordinary skill in the art would have expected Applicant's invention to perform equally well with the electrical material of Sato because the copper as recited in the claimed invention would perform equally well with the electrical material in Sato. Therefore, it would have been an obvious matter of design choice to modify the electrical material of Sato to obtain the invention as specified in claims 26 and 35.

Sato also teaches all of the limitations as set forth above including forming the second gap layer on the first gap layer and the protruding portion of the shield layer. According to Fig. 17, the second gap layer is planar. Even though Sato does not describe for forming the planar second gap layer in order to avoid detrimental ramification of reflective notching and the swing curve effect (as per claims 28, 29, 37 and 38), applicant has not disclosed that the planar second gap layer as recited in the claimed invention provides an advantage, is used for a particular purpose, or solves a stated problem. Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to have provided the planar second gap layer of Sato capable of avoiding detrimental ramification of reflective notching and the swing curve effect.

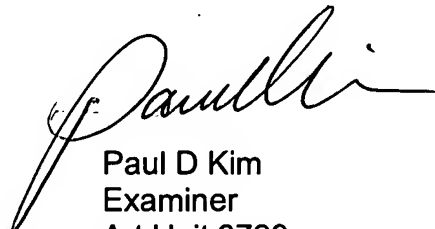
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Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul D Kim whose telephone number is 703-308-8356. The examiner can normally be reached on Tuesday-Friday between 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 703-308-1789. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Paul D Kim
Examiner
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